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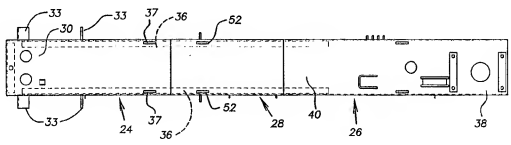

(57) Abstract

A modular housing assembly (22) for a soot blower (10) including a rear housing section (26), a front housing section (24), and an intermediate housing section (28) between the front and rear sections (24, 26). The front and rear housing sections (24, 26) have a predetermined and fixed length regardless of the combined length of the soot blower housing sections. The intermediate housing section (28) has a length which corresponds to the combined length of the housing sections.

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MODULAR SOOT BLOWER HOUSING ASSEMBLY

BACKGROUND OF THE INVENTION

The present invention generally relates to soot blowers and, more particularly, to soot blower housing assemblies.

DESCRIPTION OF RELATED ART

In the past, soot blower housings have generally been large, one-piece assemblies to which the various soot blower components are mounted. Soot blowers are manufactured in various lengths corresponding to the required lance tube travel. Accordingly, soot blower housings have, in the past, been manufactured in a corresponding number of lengths.

The manufacture and storage of numerous lengths of soot blower housings is labor-intensive and inefficient, but has been undertaken in the past due to a lack of viable alternatives. Therefore, there exists a need in the art for a soot blower housing assembly which improves manufacturing efficiency, and whereby soot blowers of various lengths can be manufactured without unnecessary duplication.

SUMMARY OF THE INVENTION

The present invention is directed toward an improved soot blower housing assembly which has better manufacturing efficiency, and which simplifies the manufacture of soot blowers. The present invention is also directed toward a soot blower housing assembly which is modular in design and which permits pre-assembly of various soot blower components. The present invention is further directed toward a soot blower housing assembly which is adapted to be made any of a variety of lengths by simply using an

intermediate section of a length corresponding to the desired soot blower housing assembly length.

In accordance with the present invention, the soot blower housing comprises a first or rear housing section, a second or intermediate housing section, and a third or front housing section. The front and rear housing sections have a fixed length regardless of the combined length of the soot blower housing. The intermediate housing section has a length which corresponds to the combined length of the soot blower housing.

In further accordance with the present invention, the rear and front housing sections are manufactured without regard to the soot blower length, and can be preassembled as sub-assemblies. The intermediate housing section length corresponds to a desired soot blower housing assembly length. The intermediate section has a pair of mounting rails secured thereto. One end of the mounting rails is secured to the front housing section and an opposite end of the mounting rails is secured to the rear housing section.

BRIEF DESCRIPTION OF THE DRAWINGS

These and further features of the present invention will be apparent with reference to the following description and drawings wherein:

FIG. 1a is a top plan view of a soot blower incorporating a soot blower housing assembly according to the present invention;

FIG. 1b is a cross sectional view of the soot blower as seen along line 1b-1b in FIG. 1a;

FIG. 2a is a top plan view of the soot blower housing assembly;

FIG. 2b is a side elevational view of the soot blower housing assembly;

FIG. 2c is an end elevational view of the housing assembly;

FIG. 3a is a top plan view of a rear housing section

assembly;

FIG. 3b is a side elevational view of the rear housing section assembly;

FIG. 3c is an end elevational view of the rear housing section assembly;

FIG. 4a is a top plan view of a front housing section assembly;

FIG. 4b is a side elevational view of the front housing section assembly;

FIG. 4c is an end elevational view of the front housing section assembly;

FIG. 5a is a top view of an intermediate housing section assembly;

FIG. 5b is a side elevational view of the intermediate housing section assembly; and,

FIG. 5c is an end elevational view of the intermediate housing section assembly of the soot blower housing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

It is initially noted that various aspects of the present invention may be illustrated in the drawing figures in a generally schematic fashion. It is further noted that the drawing figures are not necessarily to scale.

With reference to FIGS. 1a-1b, a soot blower 10 incorporating a modular housing assembly 22 according to the present invention is illustrated. The soot blower includes, in addition to the modular housing, a traveling carriage assembly 12, a lance tube 14, a lance support assembly 16, a drive motor 18, and a cleaning medium supply system 20. It is submitted that the various components of the soot blower 10, except for the modular housing assembly 22, are secured to the modular housing assembly 22 but do not necessarily form a part of the invention, except as noted hereinafter and except for the interrelationship between such components and the modular housing assembly. Therefore, the description hereinafter will be limited, in

large part, to the modular housing assembly 22, it being understood that various soot blower components and subassemblies known in the art may be used in conjunction with the modular housing according to the present invention.

As shown in FIGS. 2a-2c, the modular housing assembly 22 includes a front housing section 24, a rear housing section 26, and an intermediate housing section 28. In accordance with the present invention, and as will be described more fully hereinafter, the front housing section 24 has a predetermined length regardless of the desired length of the modular soot blower housing assembly 22. Similarly, the rear housing section 26 has a predetermined length regardless of the desired length of the modular soot blower housing assembly 22. The intermediate housing section 28 can be formed in various lengths, each of the intermediate housing lengths corresponding to a desired length of the modular soot blower housing 22.

Each of the front, rear, and intermediate housing sections 24, 26, 28 is generally made from sheet steel which has been bent into a generally upside-down or inverted U-shape. As will be described hereafter, this basic configuration is altered by the formation of a series of holes or apertures, and by the addition of a series of mounting plates or mounting structures, as will be apparent from the drawings and the description to follow. As will be further apparent, the front and rear housing sections 24, 26 can be manufactured, in large part, as sub-assemblies and subsequently joined to an intermediate housing section 28 of a desired and appropriate length corresponding to the desired length of the modular soot blower housing 22.

The front housing section 24, as shown in FIGS. 4a-4c, has a forward end portion 30 and a rearward end portion 32. The forward end portion 30 is adapted to receive the lance support assembly 16 (Fig. 1b). The forward end portion 30 also has a series of laterally-extending flanges 33 to

which a cable drive tensioning assembly 34 is secured. The forward end portion 30 also receives a pair of cable pulleys 35 (Fig. 1b) that are associated with the tensioning assembly 34. The rearward end portion 32 of the front housing section 24 is secured, by means of a pair of traveling carriage guide rails 36, to the intermediate housing section 28, as will be discussed more fully hereinafter. A pair of lifting lugs 37 extend upwardly from the rearward end portion 32.

The rear housing section 26, as shown in FIGS. 3a-3c, has a rearward end portion 38 and a forward end portion 40. The rearward end portion 38 has a series of mounting locations for the soot blower drive motor 18, drive cable, drive wheel and blowing medium valve 44 are secured (FIGS. 1a-1b). A blowing medium feed pipe extends through a spindle 46 and into the lance tube 14. The spindle 46 and lance tube 14 rotate and longitudinally slide over the feed pipe as the traveling carriage assembly 12 moves forwardly and rearwardly relative to the rear housing section 26 and the feed pipe.

The intermediate housing section 28, as noted hereinbefore and shown in FIGS. 5a-5c, has a generally upside-down U-shape and is of a length which corresponds to the length of the soot blower housing assembly 22. The pair of guide rails 36 are secured to a lower interior surface of the lateral side walls of the intermediate housing section 28. The guide rails 36 extend or project from a forward and a rearward end 48, 50 of the intermediate housing section 28. Typically, the guide rails 36 extend further in the forward direction than in the rearward direction, as illustrated. The guide rails 36 are generally C-shaped, with the open side of the "C" facing laterally inwardly toward the opposed lateral side wall of the intermediate housing section. A pair of lifting lugs 52 may also be secured to an upper surface of the intermediate housing section upper wall. The lifting lugs 52 are desirable, but may not be necessary in

situations wherein the soot blower housing assembly 22 has a length of less than twenty feet.

Generally, the front and rear housing sections 24, 26 can be preassembled, including any necessary components, and thereafter joined to the appropriately-sized intermediate housing section 28. The projection ends of the guide rails 36 are mechanically secured to the front housing section and the rear housing section. The front, rear, and intermediate housing sections are also welded together at their abutting ends. As such, the assembly of the soot blower is much quicker and easier. Moreover, once the housing sections are secured to one another, the only further assembly required generally relates to tensioning and alignment procedures, and therefore is not difficult to perform.

The preferred embodiment of the present invention has been described herein. However, it is considered apparent that the scope of the present invention is not limited to the specific embodiment described. For example, it is contemplated that the modular soot blower housing according to the present invention could readily be used with soot blowers having a different drive scheme than that shown in the drawings. Therefore, the drive mechanism and associated components are not necessary for practicing the invention, but rather are exemplary of one drive mechanism that is preferably used in combination with the present invention. Furthermore, it is contemplated that soot blowers of very short lengths, the intermediate section could be completely removed and the front and rear housing sections directly secured to one another. Furthermore, on very long soot blowers, two or more intermediate housing sections could be used. Rather, the scope of the invention is only defined by the claims appended hereto.

WHAT IS CLAIMED IS:

1. A soot blower housing, comprising:
a rear housing section;
a front housing section; and
an intermediate housing section disposed between and interconnecting said front and rear housing sections, wherein said front and rear housing sections have a predetermined, fixed length and said intermediate housing section has a length corresponding to a length of said soot blower housing.

2. A soot blower housing according to claim 1, wherein said soot blower housing can be manufactured in a plurality of lengths, and there is a one for one correspondence between soot blower housing length and intermediate housing section length.

3. A soot blower housing according to claim 1, wherein said intermediate housing section has a guide rail secured thereto.

4. A soot blower housing according to claim 3, wherein said guide rail projects from each end of said intermediate housing section.

5. A soot blower housing according to claim 1, wherein said intermediate housing section has a pair of guide rails secured thereto, said guide rails projecting from each end of said intermediate housing section and being secured to said front housing section and said rear housing section.

6. A method of manufacturing a soot blower housing, comprising the steps of:
determining a desired soot blower housing length;

providing a rear housing section and a front housing section, said front housing section having a first length and said rear housing section having a second length, said first and second lengths being independent of said desired soot blower housing length; and

selecting an intermediate housing section having a length corresponding to the desired soot blower housing length.

7. A method of manufacturing a soot blower housing according to claim 6, wherein said first length and said second length are not equal to one another.

8. A method of manufacturing a soot blower housing according to claim 6, wherein there is a one for one correspondence between desired soot blower housing length and intermediate housing section length.

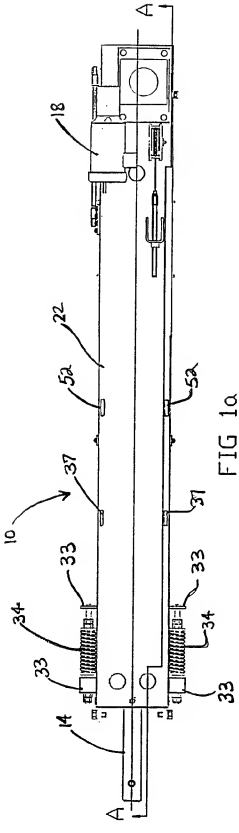

FIG 1a

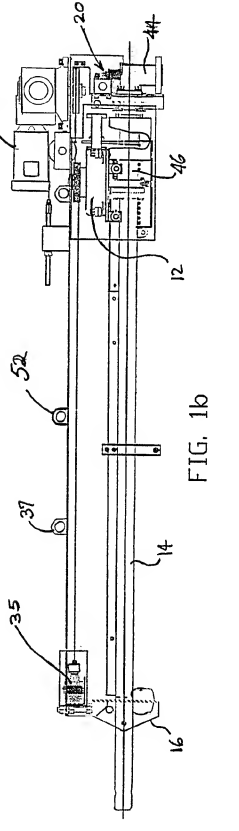

FIG. 1b

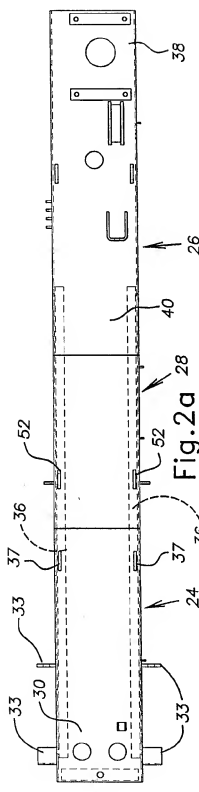

Fig.2a

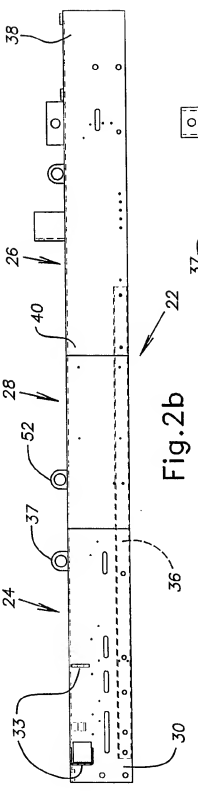

Fig.2b

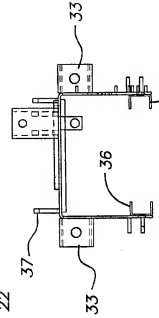

Fig.2c

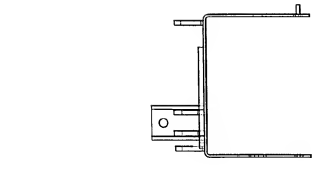

Fig.3c

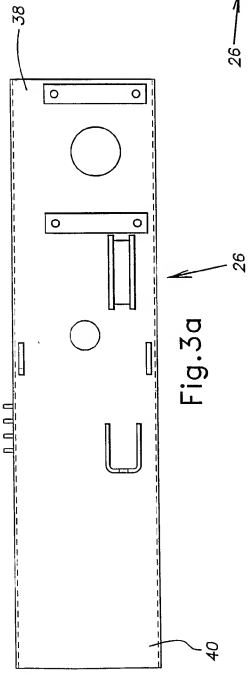

Fig.3a

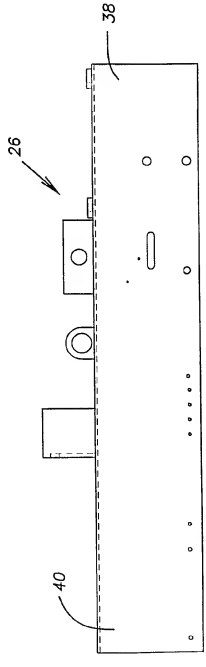

Fig.3b

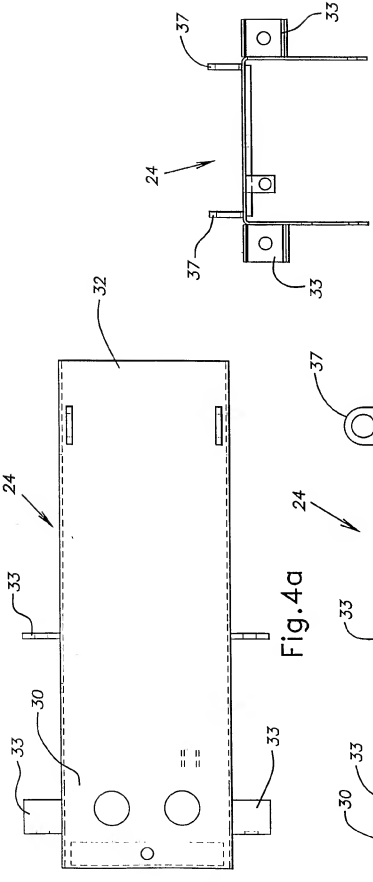
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Fig.4a
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Fig.4b
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Fig.4c

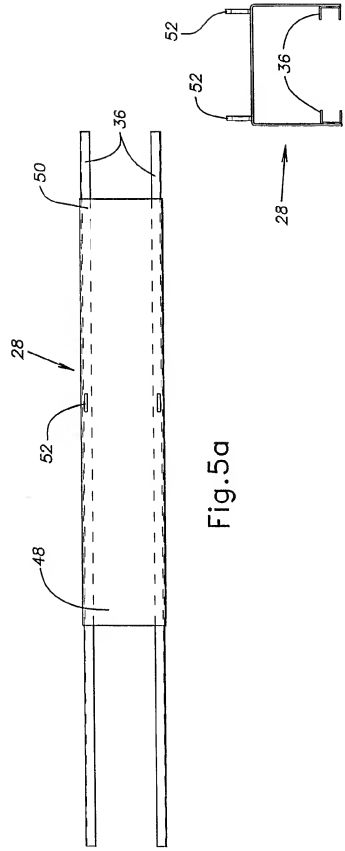
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Fig.5c
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Fig.5a
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Fig.5b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/22205

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :F23J 3/02
US CL :15/316.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 15/316.1, 318, 318.1

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,299,533 A (JOHNSTON, JR. ET AL) 05 April 1994 (05-04-94), see entire document.	1
A	US 5,337,438 A (BROWN ET AL) 16 August 1994 (16-08-94), see entire document.	1
A	US 5,353,996 A (GALLACHER ET AL) 11 October 1994 (11-10-94), see entire document.	1
A	US 5,365,890 A (JOHNSTON, JR. ET AL) 22 November 1994 (22-11-94), see entire document.	1
A,P	US 5,619,771 A (MINIC) 15 April 1997 (15-04-97), see entire document.	1
A,P	US 5,687,449 A (ZACHAY ET AL) 18 November 1997 (18-11-97), see entire document.	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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